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Corrected version

COLLET CHUCK

CROSS REFERENCE TO RELATED APPLICATIONS

This application is the US national phase of PCT application PCT/DE03/02830, filed 22 August 2003, published 25 March 2004 as WO 2004/024380, and claiming the priority of German patent application 10241613.3 itself filed 7 September 2002.

FIELD OF THE INVENTION

The inventions relates to a collet chuck or holder of a machining apparatus for a collar of a collet, tool, workpiece, or the like that has an internal angled retaining surface, having retaining jaws that are mounted on a drive spindle of the machining apparatus and that are operable by an axially shiftable head in the drive spindle and that engage for clamping with complementary angled faces on the retaining surface, and further having a retaining element mounted on the drive spindle and formed with radially deflectable retaining fingers extending parallel to the retaining jaws and having angled retaining faces complementary to the clamping faces and engageable with the clamping faces of the collar of the machining apparatus.

BACKGROUND OF THE INVENTION

Such holders, which are known for example from DE 299 22 642 and US 6,419,630, have the advantage that the retaining element retains the collar ~~is retained~~ in place during loading by the loader before the full clamping force is applied. The loader can thus release immediately so that the clamping operation is shortened. The same shortened time is achieved during release of the clamping. In spite of the good operation of such a holder it

is useful in practice when after release by the loader the collar is better and more quickly gripped.

OBJECT OF THE INVENTION

It is therefore an object of the invention to provide a holder of the above-described type where the collar is accurately positioned in the holder before application of the full clamping force as well as after it is released.

SUMMARY OF THE INVENTION

This object is achieved according to the invention in a holder of the above-described type in that each of the retaining fingers has axially inward of the respective retaining face toward the drive spindle a radially outwardly directed centering face engageable with a free end of the collar.

With such a system there is the advantage that when the collar is slid into the drive spindle it is also aligned by the centering faces so that there is more room for the clamping movement of the jaws and thus they work more surely. After release, the collar is held on center by the centering faces so that the loader can engage better into the gripper edge of the collar and clamp it.

Preferably according to the invention the centering faces act frictionally for centering and retaining. Thus on release there is the advantage that the centering and retaining faces produce friction so that a greater knockout blow can be administered to the collar so that the collar would have to be retained and held only by the retaining faces of the retaining element.

In order to retain the collar before or after application of the clamping force it is preferably that the retaining fingers be prestressed radially outward.

It is further within the scope of the invention that between each centering face and the respective retaining face there is an indent that facilitates the centering action when the collar is not perfectly centered by the loader in the drive spindle during loading.

BRIEF DESCRIPTION OF THE DRAWING

The invention is more closely described in the following with reference to an embodiment shown in the drawing; therein:

FIG. 1 is a longitudinal section through the collar-holding axial end of a holder, shown in the clamping position in the upper part and in the releasing position in the lower part;

FIG. 2 is a section taken along line II-II of FIG. 1 without the tool;

FIG. 3 is a longitudinal section showing only the retainer; and

FIG. 4 is a perspective side view of the retainer of FIG.

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SPECIFIC DESCRIPTION

FIG. 1 shows the parts relevant to the invention of a holder 1 of a machining apparatus that is basically known and that complies with what is described in DE 41 38 974 so that it does not need to be described in detail here. In an axial outer end of the holder 1 turned toward a collar 2 there is a head 3 that is connected with an actuating rod 4 that is shiftable axially of a

drive sleeve or spindle 5 so that the head 3 can be shifted from the FIG. 1 lower releasing position into the FIG. 1 upper clamping position. In the clamping position, jaws 6 of the holder 1 engage via angled clamping faces 13 with an angled shoulder or surface 7 formed in the collar 2 so as to clamp the collar 2. The holder 1 further has a retaining element 8 that is mounted in the drive spindle 5 and that has radially elastically deflectable retaining fingers 9 extending parallel to the clamping jaws 6 and having angled retaining faces 10 complementary to the angled face 7 so that they can engage the angled face 7 of the collar 2 on the machining apparatus and hold same even before the full clamping force has been exerted or after the clamping force has been released so as to make switching of the collar 2 by a loader possible. Each of the retaining fingers 9 has axially inward of the respective retaining face 10 toward the drive spindle 5 a radially outwardly directed centering face 11 engageable with the free end of the collar 2 and functioning as a result of friction as a centering and holding surface. Between each centering face 11 and the respective retaining face 10 there is an indent or notch 12; the retaining fingers 9 are prestressed radially outward.

It is therefore possible for the loader to set a collar 2 into the holder 1 where it is immediately centered and retained by the retaining element 8, the retention being done by the faces 10 and the centering being done by the faces 11. In order to clamp the collar 2 the head 3 is moved from the FIG. 1 lower position into the FIG. 1 upper position in which the jaws 6 engage the clamping face 7 and the collar 2 is gripped with considerable

force. Even after the clamping is released, that is when the head 3 is moved from the clamping position into the releasing position, the collar 2 remains on center, so a solid knockout blow delivered to the collar 2 does not however separate the collar 2 from the holder 1, since the retaining element 8 prevents excessive outward movement of the collar 2 by means of its retaining faces 10 and also its centering faces 11.